

REMARKS

Claims 1-4, 11-27 and 29-38 are pending in this application. By this Amendment, claims 5 and 28 are cancelled without prejudice or disclaimer, claims 1, 12-17, 19, 21-27 and 30-31 are amended and claims 32-38 are added. Support for new claims 32-38 can be found in the specification including the original claims and the figures, for example, see Figure 2. Reconsideration in view of the above amendments and following remarks is respectfully requested.

Applicants gratefully acknowledge the courtesies extended by Examiner Diaz and SPE Lee on July 10, 2003 in a personal interview. In the personal interview, the cited art was discussed with respect to Figure 2 of the present application. Applicants incorporate all discussion from the interview herein including the discussion regarding Wong's (US Patent number 6,232,165) buried guard rings in Figures 2G and 2H of Wong and Figure 6 of Han et al (US Patent number 5,831,313). Further, Applicants submit that all pending claims are in condition for allowance.

I. Objections

The Office Action objects to claim 21 for various informalities. Applicants respectfully submit that the above amendments obviate the grounds for the objection. Withdrawal of the objection is respectfully requested.

II. 35 U.S.C. §102(e)**A. Wong**

The Office Action rejects claims 1, 2, 4, 5 and 11-31 under 35 U.S.C. §102(e) over Wong. Claims 5 and 28 have been cancelled without prejudice or disclaimer, therefore the rejection of claims 5 and 28 is moot. Because Wong fails to disclose or suggest all the features of the remaining claims, the rejection is respectfully traversed.

Applicants respectfully submit that Wong discloses heavily implanting dopants into upper portions of regions 16 and 22, as illustrated in Figures 2G and 2H of Wong, to ensure sufficient proximity to the surface of substrate 4 so that subsequent connections may be established. See Wong, col. 5, lines 22-27. Therefore, the heavily doped regions 16 and 22 are extended from a buried region up to the surface of the substrate and form singular heavily doped regions 16 and 22 rather than separate heavily doped regions on the surface of substrate 4 and buried regions.

Therefore, Applicants respectfully submit that Wong fails to disclose or suggest, as recited in claim 1, at least the feature of a heavily doped region of buried layer having the second conductivity type formed in the first well at a distance away from the first contact region and the field oxide regions, wherein the distance is greater than 0. Rather, Wong discloses a buried guard ring, as illustrated in Figures 2G and 2H of Wong, where an upper region of the buried guard ring 16 is coplanar with an upper surface of a well 8.

With respect to claim 15, Applicants respectfully submit that Wong fails to disclose or suggest, as recited in claim 15, at least the feature of a heavily doped region of buried layer

having a second conductivity type formed in the first well, wherein the heavily doped region is isolated within the first well and separated from boundaries that form the first well, wherein the distance between the heavily doped region and the boundaries that form the first well is greater than 0. Rather, as stated above, Wong discloses a buried guard ring 16 that is located on at least one boundary that forms a well 8.

With respect to claim 24, Applicants respectfully submit that Wong fails to disclose or suggest, as recited in claim 24, at least the feature of a field oxide layer formed on an portion of a semiconductor substrate where the first well and the second well contact one another, wherein heavily doped regions of buried layer of the first and/or second conductivity type is not below the field oxide layer located. Rather, Wong discloses a buried guard ring 16 that is located below shallow trench isolation structures, including a shallow trench isolation structure 14-5 located on an portion of a semiconductor substrate where a first well and a second well contact one another.

For at least the reasons set forth above, Applicants respectfully submit that claims 1, 15 and 24 are allowable. Claims 2, 4, 11-14 and 26-27 depend from claim 1, claims 16-23, 25 and 29 depend from claim 15, and claims 30-31 depend from claim 24 and are allowable for at least the same reasons, as well as their added features and the combinations thereof. Withdrawal of the rejection is respectfully requested.

B. Han

The Office Action rejects claims 1-5, 11, 13-22 and 24-31 under 35 U.S.C. §102(e) over Han et al (hereinafter Han). Claims 5 and 28 have been cancelled without prejudice or disclaimer, therefore the rejection of claims 5 and 28 is moot. Because Han fails to disclose or suggest all the features of the remaining claims, the rejection is respectfully traversed.

Applicants respectfully submit that Han discloses heavily doped regions HDR1, HDR2, as illustrated in Figure 6 of Han, to improve both vertical and horizontal latch-up immunity. See Han, column 6, lines 36-38. Additionally, portion 104 extends from insulating structure 224 to obtain a relatively high dopant concentration directly under insulating structure 224. See Han, column 6, lines 24-30. Portion 110 also forms a region of low resistance at lower boundary 262 to improve , in conjunction with portion 104, improved both vertical and lateral latch-up immunity. See Han, column 6, lines 44-48.

However, Applicants respectfully submit that Han fails to disclose or suggest, as recited in claim 1, at least the feature of a heavily doped region of buried layer having the second conductivity type formed in the first well at a distance away from the first contact region and the field oxide regions, wherein the distance is greater than 0. Rather, Han discloses a portion 104 of a heavily doped region HDR1 which extends from insulating structure 224.

With respect to claim 15, Applicants respectfully submit that Han fails to disclose or suggest, as recited in claim 15, at least the feature of a heavily doped region of buried layer having a second conductivity type formed in the first well, wherein the heavily doped region is

isolated within the first well and separated from boundaries that form the first well, wherein the distance between the heavily doped region and the boundaries that form the first well is greater than 0. Rather, as stated above, Han discloses a portion 104 of a heavily doped region HDR1 which extends from insulating structure 224 and therefore not isolated within a first well.

With respect to claim 24, Applicants respectfully submit that Han fails to disclose or suggest, as recited in claim 24, at least the feature of a field oxide layer formed on an portion of a semiconductor substrate where the first well and the second well contact one another, wherein heavily doped regions of buried layer of the first and/or second conductivity type is not below the field oxide layer located. Rather, as mentioned above, Han discloses a portion 104 of a heavily doped region HDR1 which extends from below where an insulating structure 224 is located.

For at least the reasons set forth above, Applicants respectfully submit that claims 1, 15 and 24 are allowable. Claims 2-4, 11, 13, 14 and 26-27 depend from claim 1, claims 16-22, 25 and 29 depend from claim 15, and claims 30-31 depend from claim 24 and are allowable for at least the same reasons, as well as their added features and the combinations thereof. Withdrawal of the rejection is respectfully requested.

III. New Claims 32-38

By this Amendment, claims 32-38 are added to the Application. Claims 32-38 broadly recite features of the preferred embodiment(s). It is respectfully submitted that the new claims

are allowable over the references of record for the reasons discussed above in connection with claims 1-4, 11-27 and 29-31.

CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney, Laura L. Lee, at the telephone number listed below. Favorable consideration and prompt allowance are earnestly solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
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